

## CLAIMS

1. A process for scheduling the recording, storing, and deleting of television and  
5 Web page program material on a storage medium in a computer environment,  
comprising the steps of:

accepting as input a prioritized list of program viewing preferences;

comparing said list with the database of program guide objects;

generating a schedule of time versus available storage space that is optimal

10 for the viewer's explicit or derived preferred programs;

wherein said preferred programs include television broadcast programs and  
Universal Resource Locators (URLs); and

wherein said program guide objects indicate when programs of interest are  
actually broadcast.

15 2. The process of claim 1, wherein the viewer may request that certain programs  
be captured, which results in the highest possible priority for those programs.

3. The process of claim 1, wherein the viewer may explicitly express  
20 preferences using appurtenances provided through the viewer interface.

4. The process of claim 1, wherein said preferences may be inferred from  
viewing patterns.

25 5. The process of claim 1, wherein said preferences correspond to television  
viewing objects stored in a replicated database.

6. The process of claim 1, further comprising the step of:

providing a space schedule;

30 providing an input schedule;

wherein said space schedule tracks all currently recorded programs and the  
programs that have been scheduled to be recorded in the future; and

wherein said input schedule tracks the free and occupied time slots for each  
input source.

7. The process of claim 6, wherein the amount of space available at any given moment in time may be found by generating the sum of all occupied space or space that will be occupied at that particular time, and subtracting that from the total capacity available to store programs.

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8. The process of claim 1, wherein programs scheduled for recording based on inferred preferences automatically lose all conflict decisions.

9. The process of claim 1, wherein a program is recorded if at all times between  
10 when the recording would be initiated and when it expires, sufficient space is available to hold it.

10. The process of claim 6, wherein there must be an input available from which to record for the duration of the program.

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11. The process of claim 6, wherein only those inputs from which the desired program can be recorded are considered during scheduling.

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12. The process of claim 1, further comprising the step of:  
generating an ordered list of showings of the program of interest.

13. The process of claim 12, wherein each showing in said list is checked to see if input or space conflicts occur.

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14. The process of claim 12, wherein if a showing is found with no conflicts, then the program is scheduled for recording for said showing.

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15. The process of claim 12, further comprising the step of:  
sorting said list of showings; and  
wherein the ordering of said list results in the viewer being presented with any  
conflicting programs in order from least impact on scheduled programs to greatest.

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16. The process of claim 15, wherein for each candidate showing in said list, the viewer is presented with the option of shortening the expiration dates on conflicting programs.

17. The process of claim 15, wherein the viewer is presented with the option to cancel each previously scheduled recording that has an input conflict with the desired program.

5 18. The process of claim 1, further comprising the step of:  
providing a background scheduler.

19. The process of claim 18, wherein said background scheduler schedules each preferred program in turn until the list of preferred programs is exhausted or no  
10 further opportunity to record is available.

20. The process of claim 18, wherein a preferred program is scheduled if and only if there are no conflicts with other scheduled programs.

15 21. The process of claim 18, wherein a preferred program which has been scheduled may be deleted if it conflicts with an explicit selection or if a change in viewer preferences identifies a higher priority program that could be recorded at that time.

20 22. The process of claim 1, wherein all conflicts are resolved as early as possible.

23. The process of claim 1, wherein any schedule conflicts are determined immediately when the viewer makes an explicit selection of a program to record.

25 24. The process of claim 1, wherein if there are schedule conflicts with other programs that the viewer has explicitly selected, the viewer is asked which recordings should be canceled and which should be completed.

30 25. The process of claim 4, wherein schedule conflicts between explicit program selections and inferred "fuzzy" program selections are resolved in favor of said explicit selections without asking the viewer.

35 26. The process of claim 1, wherein the expiration time of any conflicting stored programs is shortened to exactly that needed to allow recording of a desired program.

27. The process of claim 1, wherein schedule conflicts resulting from the recording of aggregate objects are resolved using the preference weighting of the programs involved.

5 28. The process of claim 1, wherein if multiple conflicts are caused by a particular program in an aggregate object, it will only be recorded if its preference exceeds that of all conflicting programs.

10 29. An apparatus for scheduling the recording, storing, and deleting of television and Web page program material on a storage medium in a computer environment, comprising:

a module for accepting as input a prioritized list of program viewing preferences;

a module for comparing said list with the database of program guide objects;

15 a module for generating a schedule of time versus available storage space that is optimal for the viewer's explicit or derived preferred programs;

wherein said preferred programs include television broadcast programs and Universal Resource Locators (URLs); and

20 wherein said program guide objects indicate when programs of interest are actually broadcast.

30. The apparatus of claim 29, wherein the viewer may request that certain programs be captured, which results in the highest possible priority for those programs.

31. The apparatus of claim 29, wherein the viewer may explicitly express preferences using appurtenances provided through the viewer interface.

30 32. The apparatus of claim 29, wherein said preferences may be inferred from viewing patterns.

33. The apparatus of claim 29, wherein said preferences correspond to television viewing objects stored in a replicated database.

35 34. The apparatus of claim 29, further comprising:  
a space schedule;

an input schedule;

wherein said space schedule tracks all currently recorded programs and the programs that have been scheduled to be recorded in the future; and

5 wherein said input schedule tracks the free and occupied time slots for each input source.

35. The apparatus of claim 34, wherein the amount of space available at any given moment in time may be found by generating the sum of all occupied space or space that will be occupied at that particular time, and subtracting that from the total  
10 capacity available to store programs.

36. The apparatus of claim 29, wherein programs scheduled for recording based on inferred preferences automatically lose all conflict decisions.

15 37. The apparatus of claim 29, wherein a program is recorded if at all times between when the recording would be initiated and when it expires, sufficient space is available to hold it.

20 38. The apparatus of claim 34, wherein there must be an input available from which to record for the duration of the program.

39. The apparatus of claim 34, wherein only those inputs from which the desired program can be recorded are considered during scheduling.

25 40. The apparatus of claim 29, further comprising:  
a module for generating an ordered list of showings of the program of interest.

41. The apparatus of claim 40, wherein each showing in said list is checked to see if input or space conflicts occur.  
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42. The apparatus of claim 40, wherein if a showing is found with no conflicts, then the program is scheduled for recording for said showing.

43. The apparatus of claim 40, further comprising:  
35 a module for sorting said list of showings; and

wherein the ordering of said list results in the viewer being presented with any conflicting programs in order from least impact on scheduled programs to greatest.

44. The apparatus of claim 43, wherein for each candidate showing in said list, the viewer is presented with the option of shortening the expiration dates on conflicting programs.

45. The apparatus of claim 43, wherein the viewer is presented with the option to cancel each previously scheduled recording that has an input conflict with the desired program.

46. The apparatus of claim 29, further comprising:  
a background scheduler.

47. The apparatus of claim 46, wherein said background scheduler schedules each preferred program in turn until the list of preferred programs is exhausted or no further opportunity to record is available.

48. The apparatus of claim 46, wherein a preferred program is scheduled if and only if there are no conflicts with other scheduled programs.

49. The apparatus of claim 46, wherein a preferred program which has been scheduled may be deleted if it conflicts with an explicit selection or if a change in viewer preferences identifies a higher priority program that could be recorded at that time.

50. The apparatus of claim 29, wherein all conflicts are resolved as early as possible.

51. The apparatus of claim 29, wherein any schedule conflicts are determined immediately when the viewer makes an explicit selection of a program to record.

52. The apparatus of claim 29, wherein if there are schedule conflicts with other programs that the viewer has explicitly selected, the viewer is asked which recordings should be canceled and which should be completed.

53. The apparatus of claim 32, wherein schedule conflicts between explicit program selections and inferred "fuzzy" program selections are resolved in favor of said explicit selections without asking the viewer.

5 54. The apparatus of claim 29, wherein the expiration time of any conflicting stored programs is shortened to exactly that needed to allow recording of a desired program.

10 55. The apparatus of claim 29, wherein schedule conflicts resulting from the recording of aggregate objects are resolved using the preference weighting of the programs involved.

15 56. The apparatus of claim 29, wherein if multiple conflicts are caused by a particular program in an aggregate object, it will only be recorded if its preference exceeds that of all conflicting programs.

20 57. A program storage medium readable by a computer, tangibly embodying a program of instructions executable by the computer to perform method steps for scheduling the recording, storing, and deleting of television and Web page program material on a storage medium in a computer environment, comprising the steps of:  
accepting as input a prioritized list of program viewing preferences;  
comparing said list with the database of program guide objects;  
generating a schedule of time versus available storage space that is optimal for the viewer's explicit or derived preferred programs;  
25 wherein said preferred programs include television broadcast programs and Universal Resource Locators (URLs); and  
wherein said program guide objects indicate when programs of interest are actually broadcast.

30 58. The method of claim 57, wherein the viewer may request that certain programs be captured, which results in the highest possible priority for those programs.

35 59. The method of claim 57, wherein the viewer may explicitly express preferences using appurtenances provided through the viewer interface.

60. The method of claim 57, wherein said preferences may be inferred from viewing patterns.

5 61. The method of claim 57, wherein said preferences correspond to television viewing objects stored in a replicated database.

62. The method of claim 57, further comprising the step of:

providing a space schedule;

providing an input schedule;

10 wherein said space schedule tracks all currently recorded programs and the programs that have been scheduled to be recorded in the future; and

wherein said input schedule tracks the free and occupied time slots for each input source.

15 63. The method of claim 62, wherein the amount of space available at any given moment in time may be found by generating the sum of all occupied space or space that will be occupied at that particular time, and subtracting that from the total capacity available to store programs.

20 64. The method of claim 57, wherein programs scheduled for recording based on inferred preferences automatically lose all conflict decisions.

25 65. The method of claim 57, wherein a program is recorded if at all times between when the recording would be initiated and when it expires, sufficient space is available to hold it.

66. The method of claim 62, wherein there must be an input available from which to record for the duration of the program.

30 67. The method of claim 62, wherein only those inputs from which the desired program can be recorded are considered during scheduling.

68. The method of claim 57, further comprising the step of:  
generating an ordered list of showings of the program of interest.

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69. The method of claim 68, wherein each showing in said list is checked to see if input or space conflicts occur.

70. The method of claim 68, wherein if a showing is found with no conflicts, then the program is scheduled for recording for said showing.

71. The method of claim 68, further comprising the step of:  
sorting said list of showings; and  
wherein the ordering of said list results in the viewer being presented with any conflicting programs in order from least impact on scheduled programs to greatest.

72. The method of claim 71, wherein for each candidate showing in said list, the viewer is presented with the option of shortening the expiration dates on conflicting programs.

73. The method of claim 71, wherein the viewer is presented with the option to cancel each previously scheduled recording that has an input conflict with the desired program.

74. The method of claim 57, further comprising the step of:  
providing a background scheduler.

75. The method of claim 74, wherein said background scheduler schedules each preferred program in turn until the list of preferred programs is exhausted or no further opportunity to record is available.

76. The method of claim 74, wherein a preferred program is scheduled if and only if there are no conflicts with other scheduled programs.

77. The method of claim 74, wherein a preferred program which has been scheduled may be deleted if it conflicts with an explicit selection or if a change in viewer preferences identifies a higher priority program that could be recorded at that time.

78. The method of claim 57, wherein all conflicts are resolved as early as possible.

79. The method of claim 57, wherein any schedule conflicts are determined immediately when the viewer makes an explicit selection of a program to record.

5 80. The method of claim 57, wherein if there are schedule conflicts with other programs that the viewer has explicitly selected, the viewer is asked which recordings should be canceled and which should be completed.

10 81. The method of claim 60, wherein schedule conflicts between explicit program selections and inferred "fuzzy" program selections are resolved in favor of said explicit selections without asking the viewer.

15 82. The method of claim 57, wherein the expiration time of any conflicting stored programs is shortened to exactly that needed to allow recording of a desired program.

20 83. The method of claim 57, wherein schedule conflicts resulting from the recording of aggregate objects are resolved using the preference weighting of the programs involved.

84. The method of claim 57, wherein if multiple conflicts are caused by a particular program in an aggregate object, it will only be recorded if its preference exceeds that of all conflicting programs.